

**WHAT IS CLAIMED IS:**

1. An image sensing apparatus comprising:

an image sensor which is operable to generate electric charges in accordance with an exposure to an object;

a first storage section which stores image data outputted from the image sensor in a first photographing operation of accumulating electric charges in accordance with an exposure to an object for a specified exposure time;

a second storage section which stores noise data outputted from the image sensor in a second photographing operation of accumulating electric charges without exposure for a time substantially equal to the exposure time in the first photographing operation;

a multiple reference value storing section which stores multiple reference values for modifying noise data;

a reference value selecting section which compares the noise data stored in the second storage section with the multiple reference values stored in the multiple reference value storing section, and selects a reference value among the multiple reference values which is most approximate to the noise data;

a data modifying section which modifies the noise

data in accordance with the selected reference value;  
and

a subtracting section which subtracts the modified noise data from the image data stored in the first storage section.

2. The image sensing apparatus according to Claim 1, further comprising:

at least one of an exposure time detecting section which detects an exposure time of the image sensing apparatus, a photographic sensitivity detecting section which detects a photographic sensitivity of the image sensing apparatus, and a temperature detecting section which detects an internal temperature of the image sensing apparatus;

a reference value storing section which stores a plurality of reference value groups each having multiple reference values, the plurality of reference value groups in correlation with at least one of the exposure time, the photographic sensitivity, and the internal temperature of the image sensing apparatus; and

a reference value group determining section which determines a reference value group among the plurality of reference value groups based on a detection from at least one of the exposure time detecting section, the

photographic sensitivity detecting section, and the temperature detecting section;

wherein the reference value selecting section compares the noise data stored in the second storage section with multiple reference values in a reference value group determined by the reference value group determining section.

3. The image sensing apparatus according to Claim 1, wherein the interval between multiple reference values for noise data having a higher brightness level is smaller than the interval between multiple reference values for noise data having a lower brightness level.

4. The image sensing apparatus according to Claim 1, wherein the interval between multiple reference values becomes smaller as the brightness level rises.

5. The image sensing apparatus according to Claim 1, further comprising at least one of an exposure time detecting section which detects an exposure time of the image sensing apparatus, a photographic sensitivity detecting section which detects a photographic sensitivity of the image sensing apparatus, and a temperature detecting section which detects an internal

temperature of the image sensing apparatus, wherein multiple reference values are set based on a detection from at least one of the exposure time detecting section, the photographic sensitivity detecting section, and the temperature detecting section.

6. The image sensing apparatus according to Claim 1, wherein the multiple reference values are set so as to raise the brightness level as the exposure time is increased.

7. The image sensing apparatus according to Claim 1, wherein the multiple reference values are set so as to raise the brightness level as the photographic sensitivity is increased.

8. The image sensing apparatus according to Claim 1, wherein the multiple reference values are set so as to raise the brightness level as the internal temperature of the image sensing apparatus rises.

9. An exposure signal processing apparatus comprising:

a first sensing controller which accumulates electric charges in accordance with an exposure having a

specified exposure time to generate an exposure signal;

a second sensing controller which accumulates electric charges without exposure for a time substantially equal to the exposure time of the first sensing controller to generate a dark signal;

a modifier which modifies the dark signal; and

a corrector which corrects the exposure signal based on the modified dark signal.

10. The exposure signal processing apparatus according to Claim 9, wherein the second sensing controller accumulates electric charges immediately after the first sensing controller completes the accumulation of electric charges.

11. The exposure signal processing apparatus according to Claim 9, wherein the first sensing controller executes the accumulation of electric charges owing to an exposure to light from an object, and the second sensing controller executes the accumulation of electric charges without an exposure to light from an object.

12. The exposure signal processing apparatus according to Claim 9, wherein the modifier modifies the

dark signal in consideration of a noise component.

13. The exposure signal processing apparatus according to Claim 9, further comprising a modification reference value selector which includes a storage section for storing a plurality of modification reference values, and selects one among the plurality of modification reference values by comparing the dark signal with the plurality of modification reference values.

14. The exposure signal processing apparatus according to Claim 13, wherein the selector selects a modification reference value which is most approximate to the dark signal from the second sensing controller.

15. The exposure signal processing apparatus according to Claim 14, wherein the modifier modifies the dark signal in accordance with the selected modification reference value.

16. The exposure signal processing apparatus according to Claim 13, wherein the selector selects a modification reference value among the plurality of modification reference values based on a brightness level obtained from the exposure signal from the first

sensing controller.

17. The exposure signal processing apparatus according to Claim 16, wherein the interval between the plurality of modification reference values becomes smaller as the brightness level rises.

18. The exposure signal processing apparatus according to Claim 9, further comprising a detector which detects an exposure time of the first sensing controller, wherein the modifier executes the dark signal modification when the exposure time is larger than a predetermined value.

19. A method for removing noise data in an image sensing apparatus having an image sensor, comprising the steps of:

storing image data outputted from the image sensor by exposing the image sensor to an object for an exposure time;

storing noise data outputted from the image sensor by operating the image sensor without exposure to an object for a time substantially equal to the exposure time;

comparing the stored noise data with multiple reference values to select a reference value among the

multiple reference values which is most approximate to the noise data;

modifying the noise data in accordance with the selected reference value; and

subtracting the modified noise data from the image data stored in the first storage section.